
**Serbian Ceramic Society Conference**
**ADVANCED CERAMICS AND APPLICATION VI**
**New Frontiers in Multifunctional Material Science and Processing**

**Serbian Ceramic Society**
**Institute of Technical Sciences of SASA**
**Institute for Testing of Materials**
**Institute of Chemistry Technology and Metallurgy**
**Institute for Technology of Nuclear and Other Raw Mineral Materials**

# PROGRAM AND THE BOOK OF ABSTRACTS

**Serbian Academy of Sciences and Arts, Knez Mihailova 35**
**Serbia, Belgrade, 18-20. September 2017.**

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Dear Colleagues,

We have great pleasure to welcome you to the Advanced Ceramic and Application Conference VI organized by the Serbian Ceramic Society in cooperation with the Institute for Testing of Materials, Institute of Technical Sciences of SASA, Institute of Chemistry Technology and Metallurgy and Institute for Technology of Nuclear and Other Raw Mineral Materials.

Advanced Ceramics today include many old-known ceramic materials produced through newly available processing techniques as well as broad range of the innovative compounds and composites, particularly with plastics and metals. Such developed new materials with improved performances already bring a new quality in the everyday life. The chosen Conference topics cover contributions from a fundamental theoretical research in advanced ceramics, computer-aided design and modeling of a new ceramics products, manufacturing of nanoceramic devices, developing of multifunctional ceramic processing routes, etc. Traditionally, ACA Conferences gather leading researchers, engineers, specialist, professors and PhD students trying to emphasizes the key achievements which will enable the wide speared use of the advanced ceramics products in High-Tech industry, renewable energy utilization, environmental efficiency, security, space technology, cultural heritage, prosthesis, etc.

Serbian Ceramic Society has been initiated in 1995/1996 and fully registered in 1997 as Yugoslav Ceramic Society, being strongly supported by American Ceramic Society. Since 2009, it has continued as Serbian Ceramic Society in accordance to the Serbian law procedure. Serbian Ceramic Society is almost the only one Ceramic Society in the South-East Europe, with members from more than 20 Institutes and Universities, active in 16 sessions, by program and the frames which are defined by the American Ceramic Society activities.

For the first time Advanced Ceramic and Application Conference hosting delegations from Republics of Ghana, Nigeria, Niger and Cameroon with the idea to connect, share and provide positive influence to the scientific and industrial communities all around world.

Prof. Dr Vojislav Mitić
*President of the Serbian Ceramic Society*
*World Academy Ceramics Member*
*European Academy of Sciences&Arts Member*

Prof. Dr Olivera Milošević,
*President of the General Assembly of the Serbian Ceramic Society*
*Academy of Engineering Sciences of Serbia Member*

**Conference Topics**

- Basic Science & Sintering of Ceramics
- Nano, Bio- & Opto Ceramic
- Electro & Multifunctional Ceramics
- Magnetic, Catalytic & Composite Materials
- Renewable Energy, Heritage & Archeology
- Industrial Talks

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**P36**

# Fractal Simulator and Ceramics Technology for New Tesla's Fountain

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In this study, we present new Tesla's Fountain model in ceramics technology. It is reconstructed from basic 3D model. The model is designed based on Tesla's original US patent no. 1,113,716, granted on October, 13 (1914). The complete model includes the engine (rotating water pump), colored lights and fluids. This part of the paper is based on research within the project entitled "Computer Simulation and Modeling of the Original Patents of Nikola Tesla" and approved by the Ministry of Education, Science and Technological Development of the Republic of Serbia. The first Tesla's patent that was under our attention in this project was Tesla's Fountain that is presented in this paper.

It is well known that first Tesla's experiments on Fountain have been realized in materials like bronze-metal. Nevertheless, we used new approach and applied ceramics materials technologies in combination of casting and sintering. We used our original fractal simulator to observe and simulate micro particles movements in Fountain model

Finally, we used smoothed-particle hydrodynamics (SPH) as a method of computation and simulating the dynamics of continuum media, like the flow of fluids. The method was developed by Gingold, Monaghan and Lucy in 1977, initially for astrophysical problems. It is also used in astrophysics, ballistics, volcano logy, and oceanography but we find new appliance in our Fountain model. We combine a mesh-free Lagrange method (coordinates move with the fluid) to easily adjust resolution of the simulation with respect to all variables (like the density).